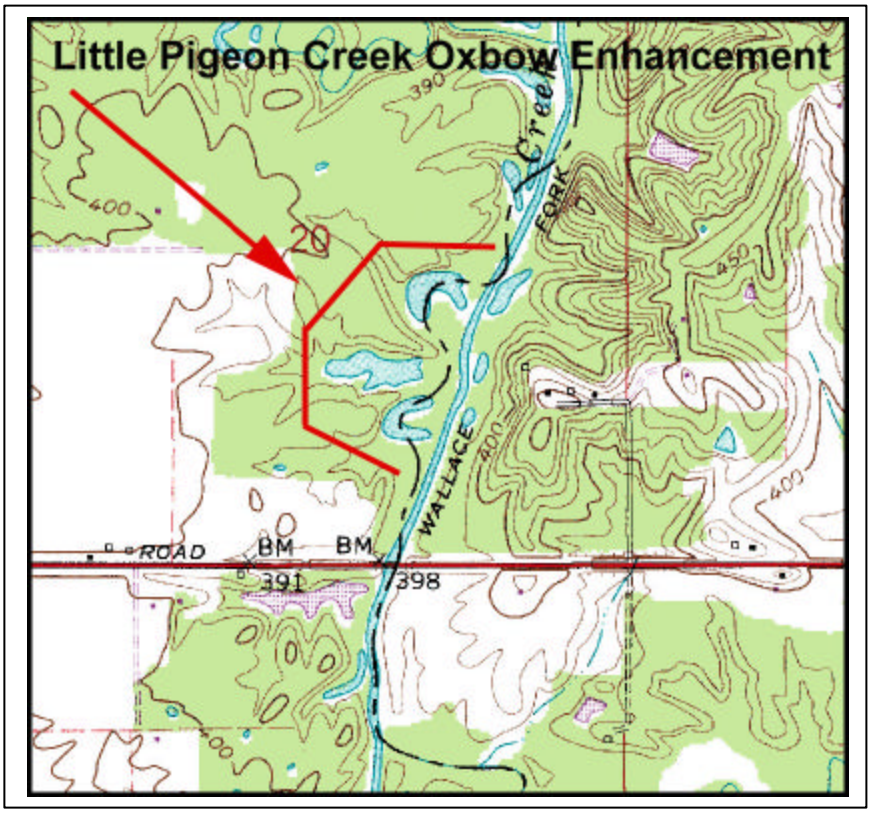
UPPER LITTLE PIGEON CREEK OXBOW ENHANCEMENT (IN-26)

1.0 Location

The proposed Upper Little Pigeon Creek Oxbow Enhancement project is located in Warrick County, Indiana. The project area is approximately 20 miles upstream from the confluence of Little Pigeon Creek with the Ohio River. The project site is within the Louisville District, U.S. Army Corps of Engineers (USACE).



2.0 Project Goal, Description, and Rationale

The primary goal of the Upper Little Pigeon Creek Oxbow Enhancement project would be to enhance water control to a small oxbow adjacent to Little Pigeon Creek. The project would involve the construction of a small levee and water control structure on Indiana Department of Natural Resources (IDNR) Division of Fish and Wildlife property. The water control structure would allow better control for flooding and dewatering the area. The increased water retention in the oxbow would benefit waterfowl and other wildlife.

3.0 Existing Conditions

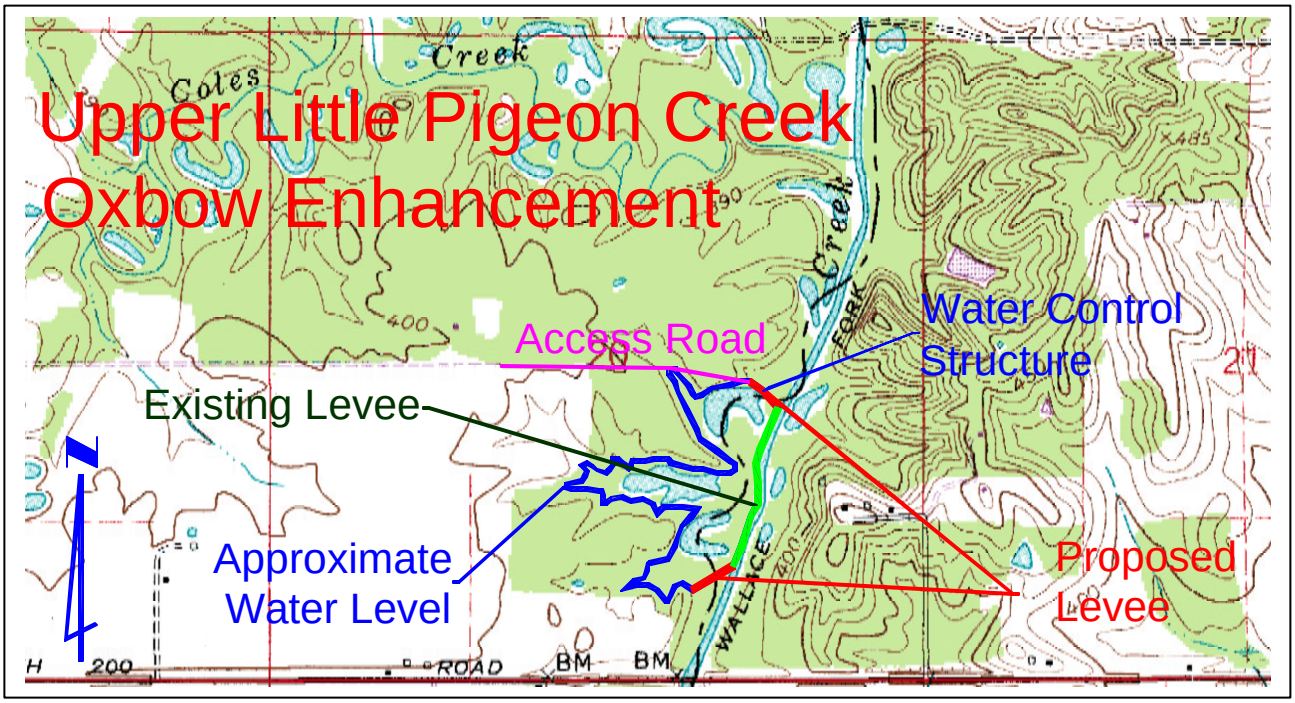
Terrestrial/Riparian Habitat: The terrestrial and riparian resources on the project area consisted mainly of a diverse bottomland hardwood and riparian forest. The dominant species in the low areas were buttonbush (*Cephalanthus occidentalis*) and silver maple (*Acer saccharinum*). The higher areas were dominated by various oak species (*Quercus* spp.) and shagbark hickory (*Carya ovata*).

Aquatic Habitats: Aquatic resources on the project area included several small remnant oxbows of Little Pigeon Creek. There were some disjunct depressional areas that appeared to hold water year round. These areas were dominated by obligate wetland species such as buttonbush.

Wetlands: The areas adjacent to the oxbows and portions of the old channel were considered jurisdictional wetlands. Overbank flooding frequently inundates the surrounding bottomland hardwood community.

Federally-Listed Threatened and Endangered Species: According to the U.S. Fish and Wildlife Service (USFWS), there are no federally-listed threatened or endangered species known to occur in Warrick County, Indiana.

4.0 Project Diagram



5.0 Engineering Design, Assumptions, and Requirements

5.1 Existing Ecological/Engineering Concern

The primary concern is the lack of water control and the desire to regulate water levels for multiple benefits, including habitat enhancement, protection, and restoration, waterfowl hunting, and non-consumptive public uses such as bird watching.

5.2 Wetland Enhancement

Two small levees 3-feet high would be constructed, as shown on the project diagram. The new levees would be approximately 350 feet in length and tie into the existing spoil levee along Little Pigeon Creek. The levees would work in conjunction with a flashboard-riser water control structure to provide a seasonally flooded impoundment. The created wetland would be approximately 26.5 acres. A water control structure constructed of reinforced concrete would be installed within the levee at the downstream end of the pool. The flow line elevation would be below the bottom of the wetland pool. A metal channel would be installed vertically in the flashboard slots because wood and metal stop-logs do not seal well against concrete and considerable leakage can occur. The height of the opening would be 2 feet, allowing for 1 foot of freeboard. The width of the opening would be 2 feet and would allow for the wetland to be drained in approximately 3 days. A grass-lined emergency spillway would be provided to accommodate storm events. Concrete wingwalls on upper and lower sides of the levee would be used to protect the levee from erosion and reduce seepage around the control structure. Water regulation is achieved by placing "stop-logs" or "boards" in control slots to the desired elevation. Logs are commonly made of treated timber, metal, concrete, or PVC. A gravel access road would be provided to allow access to the water control structure for maintenance.

5.3 Planning/Engineering Assumptions

- The levees would be created using materials from on site.
- The water control structure would be designed to allow complete drainage of the wetland in approximately three days.
- The existing spoil levee adjacent to Little Pigeon Creek contains no defects, and is functioning properly.

6.0 Cost Estimate (Construction) Engineering costs for the proposed project are contained on Table 1. A detailed MCACES cost estimate for the proposed project is included in Appendix C.

Table 1. Engineering Costs.	
Item	**Cost**
Levee Construction	$4,200
Water Control Structure	$6,400
Access Road	$34,100
Mobilization	$8,000
TOTAL	**$52,700**

7.0 Schedule - The estimated construction time for this project is shown on Table 2.

Table 2. Construction Schedule.	
Item	**Time**
Levee Construction	4 Days
Water Control Structure	14 Days
Access Road	12 Days
Mobilization	4 Days
TOTAL	**34 Days**

8.0 Expected Ecological Benefits

Terrestrial/Riparian Habitats: The impacts of the Upper Little Pigeon Creek Oxbow enhancement project would be primarily in-stream. There would be no foreseeable beneficial impacts to terrestrial or riparian habitats as a result of implementing the proposed project.

Aquatic Habitats: Long-term beneficial impacts to aquatic resources would be anticipated as a result of implementing the proposed project. The installation of a water control structure would enhance both the extent and duration of flooding. Seasonal habitat for fishes and aquatic invertebrates would be provided by this project.

Wetlands: The installation of a water control structure would allow managers to implement management strategies such as greentree reservoir management. Greentree reservoir construction and management would benefit many wetland species. Flooding strategies on greentree reservoirs would produce invertebrate populations earlier, more consistently, and in greater numbers relative to naturally flooded sites. Water management would also allow waterfowl to take advantage of seeds and mast produced by trees in the bottomland hardwood ecosystem. Several species of waterfowl use forested wetlands during part of their annual life

cycle. Mallards for example, use forested wetlands extensively during molting and pairing to obtain food resources and protection from predators (Reinecke et. al, 1989).

Federally-Listed Threatened and Endangered Species: Since there are no federally-listed threatened or endangered species in Warrick County, no foreseeable beneficial impacts would result from this project.

Socioeconomic Resources: Implementation of the proposed project could result in long term beneficial impacts to socioeconomic resources through increased recreational activities. Hunting and birdwatching opportunities would provide long-term benefits to socioeconomic resources in the area.

9.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitats: There would be short-term adverse impacts to terrestrial and riparian resources due to construction-related noise and disturbance. Some areas of existing vegetation would be cleared during construction activities.

Aquatic Habitats: There would be short-term adverse impacts to aquatic habitats due to construction related activities. Water quality in the project area would be impacted by increased erosion and siltation during construction.

Wetlands: There would be no reasonably foreseeable adverse impacts to jurisdictional wetlands as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: Since there are no federally-listed threatened or endangered species in Warrick County, no foreseeable adverse impacts would result from this project.

Socioeconomic Resources: There would be no reasonably foreseeable adverse impacts to socioeconomic resources as a result of implementing the proposed project.

10.0 Mitigation

There would be no mitigation necessary for this project. The use of best management practices and proper construction techniques would minimize adverse water quality impacts.

11.0 Preliminary Operation and Maintenance Costs:

Table 3. Operation and Maintenance Costs

Maintenance	Frequency	Costs
Levee and water control structure	25 Years	$10,000

12.0 Potential Cost Share Sponsor(s)

- Indiana Department of Natural Resources
- Ducks Unlimited

13.0 Expected Life of the Project

As presently envisioned the Upper Little Pigeon Creek Oxbow project area will be managed in perpetuity for the benefit of natural resources by the Indiana Department of Natural Resources.

14.0 Hazardous, Toxic, and Radiological Waste Considerations

Potential impacts of hazardous, toxic, and radiological waste (HTRW) at the site were visually assessed during a site visit.

Site Inspection Findings.

The project involves the restoration of an oxbow remnant of Little Pigeon Creek about 20 miles upstream from the creek's confluence with the Ohio River. The restoration area is in Warrick County, Indiana.

The following environmental conditions were considered when conducting the July 1, 1999 project area inspection:

- Suspicious/Unusual Odors;
- Discolored Soil;
- Distressed Vegetation;
- Dirt/Debris Mounds;
- Ground Depressions;
- Oil Staining;
- Above Ground Storage Tanks (ASTs);
- Underground Storage Tanks (USTs);
- Landfills/Wastepiles;
- Impoundments/Lagoons;
- Drum/Container Storage;
- Electrical Transformers;
- Standpipes/Vent pipes;
- Surface Water Discharges;
- Power or Pipelines;
- Mining/Logging; and
- Other.

None of the environmental conditions listed above were observed in the project area.

15.0 Property Ownership & River Access

Selected data on properties immediately adjacent to or within each concept site was collected from the county courthouse of the respective county of each site. Data collected included map and parcel identification number, property owner's name and mailing address, acreage of the potentially affected parcel, and market value of the parcel. This procedure involved obtaining a plat or parcel map of the site and surrounding area which identified each parcel with a corresponding map and parcel number. The map/parcel identification number was subsequently used to determine the property owner's name and mailing address from records in the County Assessor's or County Auditor's office. Plat/parcel maps were collected for each site.

The market value of each parcel as contained in the property tables reflects the assessed valuation to supposedly market value ratio used in each State for taxation purposes. These assessed values reflect 1998 assessments. The assessed valuation ratio is 33.3 percent for Indiana.

The above ratios were used to approximate the market value of each property. However, in many instances the resultant market value calculated under the above procedure is

considerably below the actual value of the land in the real market. Local real estate brokers could provide a more accurate estimate of actual land values.

The collected property data indicate that public lands are adjacent to the Upper Little Pigeon Creek Oxbow Enhancement area. No private lands will be needed or disturbed for this project. The majority of the property under consideration is in state ownership.

Table 4. Property Characteristics

Site Name: Upper Little Pigeon Creek Oxbow Enhancement
Location: Warrick County, Indiana

Map/Parcel Number	Owner	Mailing Address	Market Value	Acreage
20/6	Indiana Department of Natural Resources	402 West Washington St. Indianapolis, IN 46204		30.00
20/7	Indiana Department of Natural Resources	402 West Washington St. Indianapolis, IN 46204		40.00
20/12	Indiana Department of Natural Resources	402 West Washington St. Indianapolis, IN 46204		40.00

* Denotes improvements on property.

16.0 References

Reinecke et al., 1989	Reinecke, K.J., R.M. Kaminski, D.J. Moorhead, J.D. Hodges, and J.R. Nassar. 1989. Mississippi Alluvial Valley. in L.M. Smith, R.L. Pederson, and R.M. Kaminski, eds. Habitat Management for Migrating and Wintering Waterfowl in North America. Texas Tech Univ. Press, Lubbock.

APPENDIX A Threatened & Endangered Species

APPENDIX B Plan Formulation and Incremental Analysis Checklist

Project Site Location: The proposed Upper Little Pigeon Creek Channel Restoration project is located in Warrick County, Indiana. The project area is approximately 20 miles upstream from the confluence of Little Pigeon Creek with the Ohio River. The project site is within the Louisville District, U.S. Army Corps of Engineers (USACE).

Description of Plan selected: The primary goal of the Upper Little Pigeon Creek Oxbow Enhancement project would be to enhance water control to a small oxbow adjacent to Little Pigeon Creek. The project would involve the construction of a small levee and water control structure on Indiana Department of Natural Resources (IDNR) Division of Fish and Wildlife property.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? No and description

Larger Size Plan Possible? Yes and description

Increase the amount of management implemented on the area.

Other alternatives? No

Restore/Enhance/Protect Terrestrial Habitats? Yes **Objective numbers met** T1

Restore, Enhance, & Protect Wetlands? Yes **Objective numbers met** W1,W3

Restore/Enhance/Protect Aquatic Habitats? Yes **Objective numbers met** A1,A8

Type species benefited: Resident and migratory wildlife, especially waterfowl

Endangered species benefited: None

Can estimated amount of habitat units be determined: Approximately 26 acres of oxbow/wetland habitat will be created/restored.

Plan acceptable to Resources Agencies?
U.S. Fish & Wildlife Service?
State Department of Natural Resources? Indiana Dept. of Natural Resources

Plan considered complete? Yes **Connected to other plans for restoration?** No

Real Estate owned by State Agency? Yes **Federal Agency?** No
Real Estate privately owned? No
If privately owned, what is status of future acquisition

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

Yes This plan increased the amount of seasonally-flooded aquatic habitat and increases habitat diversity.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

Unknown

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?
Yes / No
Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity:_____
Non-government Entity _____

Corps Contractor _____Date_____

U.S. Fish & Wildlife Representative _____Date_____

State Agency Representative _____Date _____

U.S. Army Corps of Engineers Representative _____Date _____

Terrestrial Habitat Objectives

T1 Riparian Corridors

T2 Islands

T3 Floodplains

T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

W1 Forested Wetlands: Bottomland Hardwoods

W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands

W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)

A2 Riverine submerged and aquatic vegetation

A3 Sand and gravel bars

A4 Riffles/Runs (tailwaters)

A5 Pools (deep water, slow velocity, soft substrate)

A6 Side Channel/Back Channel Habitat

A7 Fish Passage

A8 Riparian Enhancement/Protection

APPENDIX C Micro Computer-Aided Cost Engineering System (MCACES)